# The MAC Flyer

MARCH 1972

## THOSE OTHER CAUSE FACTORS

MILITARY AIRLIFT COMMAND
GEN JACK J. CATTON Commander
LT GEN JAMES C. SHERRILL Vice Commander
COL HOLLON H. BRIDGES Inspector General
COL N. C. FLYNN Director, Safety Division

For Greater Efficiency
in MAC Air Operations

# The MAC Flyer

THE STAFF
MAJ RICHARD L. WING Supervising Editor
MAJ EDWIN C. ROSS Associate Editor
CAPT PHILLIP R. BUDD Associate Editor
MARILYN A. BOLIEAU Managing Editor
TSGT WAYNE L. MILLS Art Director

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COVER: Before the wreckage has cooled, investigators will probably uncover some of "Those Other Cause Factors"; check page three.

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## SQUAWK BOX:
### On Changes

Ah, yes — here it is March again. Stateside readers will note a warming trend, while paradise residents (Hawaii, Athens, etc.) may just see different shadows cast by the flagpole. Here at THE MAC FLYER, we've logged a few changes too. Page 28 warns that our writing contest is about to close — got your entry done? And the distribution system for your friendly flying safety rag has also changed, so if you find copies are hard to come by, best get in touch with your fly safe rep and have him rattle your PDO.

You also might have noticed that our traditional March review of the previous year's aircraft accidents has been dropped. Why? To quote someone above us in the safety heirarchy, "Portions of the article . . . '1970 Aircraft Accident Review,' violate . . . AFR 127-4." So, no single-package rundown of this year's grim harvest. Instead, the more interesting accidents will be featured in our "Mishap with a Moral" series, where we'll be able to offer you more details than before. Incidentally, we've found that most of you prefer reading bash rehashes to wading through stock prevention stuff.

Another change *didn't* make the scene: our hoped-for Letters to the Editor column. In six months we collected — a bit of flak from the Hickam O Club touting their new facilities and service (we checked; both are good); a request to retire C. R. Terror due to his image and high mileage; a broadside concerning aspersions cast on our female airmen (mostly inadvertent); and some requests for distribution changes. Hmmm. Is anybody out there?

One more thought: We still need replies to last month's "Speak Up!" challenge. If you missed that, look for a February issue and do Speak Up! — it's your big chance to tell us off.

Ever wonder what leaves a pilot with the short end of the stick? Usually it's . . .

# Those Other Cause Factors

EAVESDROPPING ON A MYTHICAL CONVERSATION:

"Hey, Joe, why do they have accident investigations?"

"Oh, I guess so they can find out what caused the accident."

"Well, don't they usually find pilot error?"

"From all I've heard, they do."

"Then it seems like it would save a lot of money to just stamp the report 'pilot error' and forget the big investigating board thing."

"Oh, they must turn up a lot of good stuff — aren't there contributing causes or something like that?"

"Couldn't prove it by me — all they ever do is try to hang the driver."

"Man, you know it!"

* * *

Thus ends the mythical conversation — and begins our discussion. Yes, we *do* know that pilots cause accidents. Even a casual scan of accident reports will show that the pilot is named as the primary cause about half the time. But we also know that almost always the pilot was placed in an abnormal situation by other circumstances — in other words, there were contributing causes. These causes are defined as actions, events, conditions, or circumstances which did not cause the accident but directly contributed to it. In the majority of our accidents, several such contributing cause factors were identified—we'll call them those other cause factors.

**Contributing Cause Factors (excluding primary)**

| | Number of Accidents Involving This Cause | Number of Times Cause Factor Was Cited | Percent of Total Contributing Causes |
|---|---|---|---|
| Supervisors | 10 | 16 | 33 |
| Pilots | 7 | 10 | 21 |
| Miscellaneous | 5 | 10 | 21 |
| Materiel | 7 | 10 | 21 |
| Design Deficiency | 1 | 1 | 2 |
| Environmental | 1 | 1 | 2 |
| | N/A | 48 | 100 |

For this discussion, let's consider those things which helped produce our accidents, but did not actually cause them. Here's a run-down, including all listed contributing causes from our 19 major aircraft accidents during 1970 and 1971.

Starting from the bottom up, consider those statistics. Design and environmental — almost "out of the blue"

problems. Materiel? This area leads to the vast majority of our incidents and hazards, but routine Dash One actions save the day. Miscellaneous? Like design and environmental — the slide rule boys crank in some improvement, but most aspects are pretty remote from pilotage. So that leaves the big two.

## Supervisory Contributions

First, let's look at that big supervisory contributing factor — all 33 percent of it. In the past two years, supervision contributed to 10 of the 19 accidents. (Primary cause of five of these ten accidents was pilot error — at a quick glance it looks like supervisors and pilots work pretty hard at contributing to accidents.)

The level of supervision identified as a contributing cause factor ranged all the way from major command headquarters down to line supervisors working in detachments. Systems managers, contractors, and even aircraft manufacturers contributed to our accidents.

The big question, of course, is this: As a pilot, could you have prevented any of these bashes? We'll examine a few.

ABOVE: Lack of proper training helped set up this one. BELOW: Paper work contributed to this wreck.

★ A four-engine transport skidded off the side of the runway and played snow plow, doing major damage to the aircraft. The pilot was identified as primary cause factor because he used improper reverse thrust procedures. But why did he use improper procedures? A contributing cause was supervision because the simulator course and verbal emergency procedures test did not cover proper reversing procedures. Now, we're not saying the supervisor created this accident, because pilots must know the emergency procedures. But you can sure help yourself a bunch if you make a little noise about weak training programs. If the chiefs don't put any emphasis on the procedure, then you're bound to be lulled into doing the same thing. Then an accident happens and you're responsible, not them. Talk to your training and standboard people, and if you don't get positive corrective action, then write hazard reports or talk to the IG. Above all, stay current on procedures — at least practice them mentally if no method is provided for actual training. The Lord helps those who help themselves. It shouldn't have to be this way — but it is.

★ A large transport terminated its flight at the eight thousand foot level of an eighty-two hundred foot mountain. While pilot factor was the primary cause, supervision sure helped set up the accident. The command post issued a high altitude computer flight plan for a

low altitude flight. You just can't take anything for granted!

★ A transport, making a missed approach, lost an engine and crashed off the end of the runway. Pilot error again because the pilot misidentified the failed engine and shut down the good engine. Supervision contributed because the contractor's actions to identify and correct a known manufacturing deficiency were inadequate. Just a week before this accident, the same unit had the same type of engine failure during an aborted takeoff. We'll agree that you, as a pilot, would be pretty hard pressed to see this one coming and try to head it off. But you can and should be aware of your unit's incidents and mentally plan your actions or talk them over with your copilot, in case you face the same thing. If you condition yourself to expect the worst to happen on every takeoff and landing, your chances of survival will increase when something does happen.

★ Finally, a helicopter accident was caused by poor maintenance, but supervision contributed. The chopper was being readied for takeoff when it suddenly leaped into the air, crashed on its side, and beat itself to death. Maintenance personnel had worked on the engine, but did not make any write-ups in the forms. Consequently, the repair work was not inspected or signed off. Unfortunately the mechanics left out the governor drive shaft. Since the commander and maintenance supervisor had not instilled in their people the proper discipline of forms documentation, supervision was a prime contributor. The question: "How many times have *you* contributed to such laxity by not making proper write-ups in the form? How many times have you just *told* the maintenance man what was wrong?" We're sure everyone has been guilty; you're contributing to your own accident. Contribute to your survival by setting the example. Do it the way it's supposed to be done. Write it up.

Point one is this: Supervisors can set you up for a bash but you can catch their error. Don't take anything for granted.

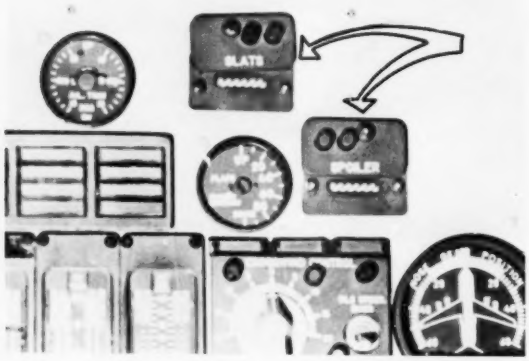
Now, on to another fertile area — what you do to set *yourself* up for an accident.

## Pilot Contributions

In nine accidents, pilots were tagged for primary cause; in five of these, pilots also contributed. Counting the two where supervision (IP) was primary and pilot factor also contributed, then there were seven accidents where pilots starred in "supporting" roles. There's a

ABOVE: Just a matter of salvage, after two pilots erred. BELOW: Communications problems, throttle friction, a ten-foot hover at night, and pilot inattention wiped this one out.

ABOVE: Fuel mismanagement set it up; an improper autorotation bashed it. BELOW: Misreading similar indicators may have contributed to the accident.




strong hint here that we may be our own worst enemy. Let's look at some of these mishaps.

★ During a simulated flameout approach, the aircraft landed short of the runway, bounced back in the air, hit again, and ziggied across the ramp, totalling the aircraft and killing a maintenance troop. The IP was tagged with primary cause (supervision) because he allowed the student to stall the aircraft and hit short. Though the pilot had been told to go around and had moved the throttles forward to stabilize the engines prior to adding go-around power, he never again increased power and he forgot to retract the speed brakes. A basic procedure — somehow missed or forgotten — almost cost this pilot his life. Missing an emergency procedure item on a checklist can be fatal.

★ Checklists and procedures got us on another one too. A copilot missed or misread a slat position indicator while running the after takeoff checklist. Because of this, the slat-extended max airspeed was exceeded and the slats were torn from the aircraft. Aircrew factor was a contributing cause because the spoiler position indicators were possibly mistaken for the slat indicator. Methodical checklist accomplishment would have prevented the entire episode.

★ As we mentioned earlier, not maintaining adequate terrain clearance cost us a crew and aircraft. The primary cause was aircrew factor (driving into a mountain almost always is). But the pilots and navigators pulled the wool over their own eyes when they accepted a high altitude flight plan for a planned flight at 8,000 feet. If they had refused the computer flight plan, or filed for and flown a flight level assuring them proper terrain clearance, this accident would not have happened.

Okay, now let's go back to where we started — the end of our mythical conversation. The whole idea of accident investigation is to gain knowledge to prevent future mishaps — not to pin the blame on someone. Hopefully, what we've shown you in these few examples is not that pilots can cause accidents (bet you knew that all along), but that pilots and supervisors can set you up for an accident — and it's up to *you* to cut these contributing causes off at the pass. How? Be skeptical. Think ahead a bit. Refuse to be distracted or unduly rushed. Consider those who fondle your life as worthy of close watching.

You know — and we know — you're a safe pilot. But keep an eye out for those around you who might not be working on your side. Note: Contributing causees rarely go down with the ship.

**All aircraft, including our C-141s, are normally controllable about three axes: yaw, pitch, and roll. But not always!**

# Captains Dixon and Adams

EARLY THIS WINTER, Captain Russell L. Dixon, from the 437th MAWg, was the aircraft commander on a C-141 inbound to an overseas base. Cleared for an ADF approach to the field, Capt Dixon disengaged the autopilot and, flying the aircraft manually, intercepted the inbound course. Moments later the control tower operator cleared him for a VFR traffic pattern. With the Starlifter established on a right downwind leg, the crew lowered the landing gear, approach flaps, and completed the before landing checklist. Approximately four miles from the field, Capt Dixon started a shallow turn to final approach and called for full flaps. Suddenly, he felt the control wheel jerking to the right and the bank started increasing. Confirming that his copilot, Captain Walter A. Adams, wasn't on the controls with him, Capt Dixon attempted to roll the wings level — only to discover that he couldn't! By holding heavy left aileron pressure he was only able to keep the right bank from increasing!

While Capt Dixon was still struggling with the ailerons, the yoke suddenly tried to pitch forward, throwing the big transport into a dive! He called for Capt Adams to get on the controls with him, and together the two pilots were able to roll the wings almost level and slow the rate of descent.

Since their problems seemed to be hydraulic, Capt Dixon called for the flight engineer to shut down the number two hydraulic system. But, when the numbers one and two engine driven hydraulic pumps were turned off, the pilots experienced uncontrollable nose down pressure on the control columns! The pumps were turned back on immediately and the pilots regained what control they'd had before. By this time the aircraft was on short final approach and, because Capt Dixon wasn't sure they could maintain control much longer, he decided to attempt a landing.

About 200 feet above the ground, the rudder got into the act and yawed the aircraft hard right! By applying heavy left rudder pressure, Capt Dixon was able to straighten the aircraft out as they crossed the runway threshold.

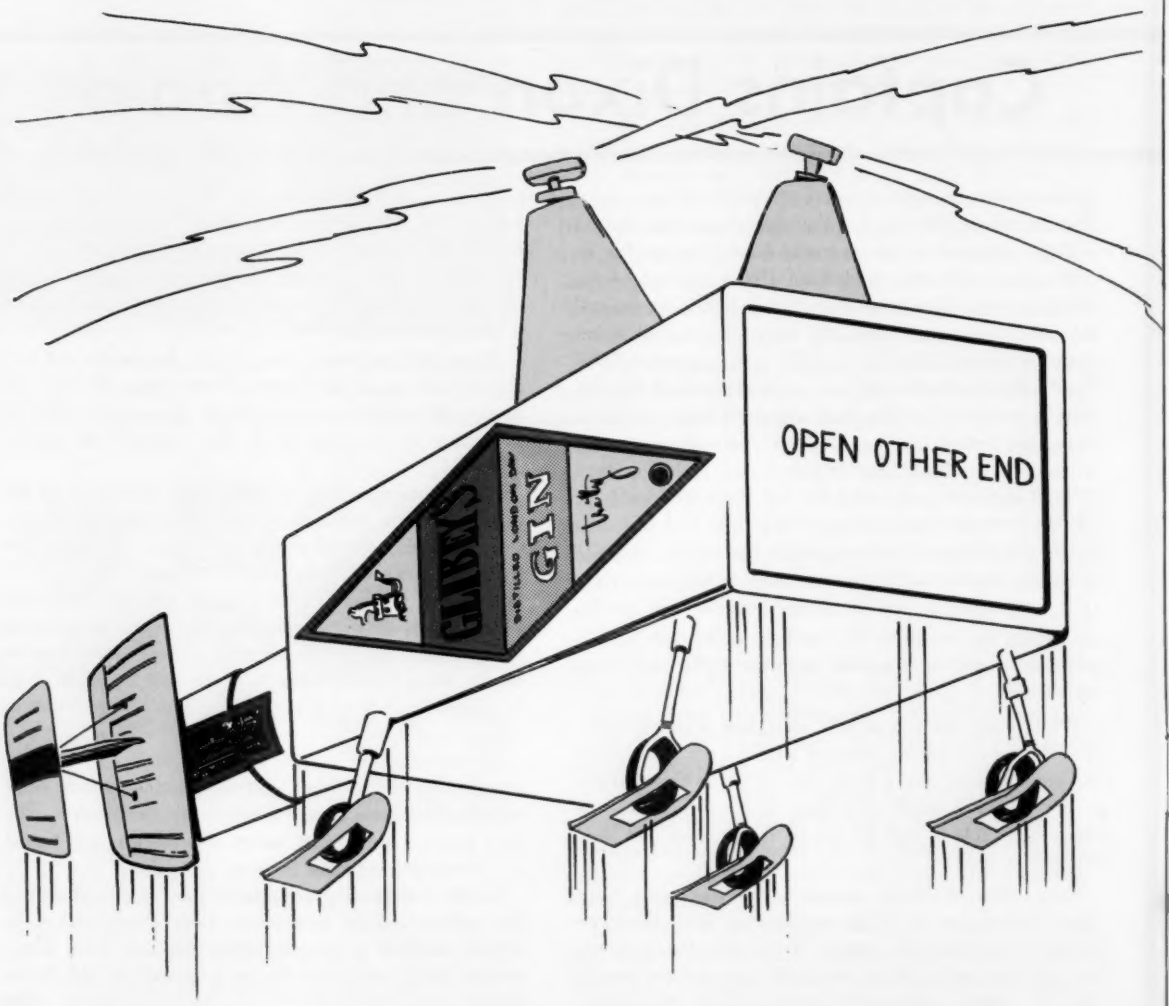
Both pilots were pulling on the yoke, trying to get the nose up before touchdown, when suddenly about five feet above the ground there was a loud popping noise from the underdeck area. Then, the control columns became easier to move in the elevator axis and, with this added degree of control, the pilots were able to complete a slight flare before the aircraft touched down heavily on the main landing gear. The aircraft bounced once. On the second touchdown, the spoilers were deployed manually, and the flight was over.

An investigation of the aircraft's flight control systems uncovered extensive hydraulic contamination, some internal leaks, and several badly worn components. The loud popping noise just before touchdown was traced to a broken shear rivet between the yokes.

For the outstanding airmanship they displayed during this serious inflight emergency, Capt Dixon and Capt Adams received a congratulatory message from Commander MAC. THE MAC FLYER is proud to add, Good Show!

For of all sad words of tongue or pen,
The saddest are these:

# It Might Have Been



by Capt Dennis W. Stiles
67 ARRSq

THE AMISH SAY that if you hear a cat howling after midnight you'll have three days of bad luck. I don't believe it, of course, but just day before yesterday — Tuesday night it was — I woke up at 3 a.m. and heard a cat yowling on the front porch. I went down and fed it a healthy dose of bedroom slipper, and it skittered around the corner. But then yesterday, Wednesday, these little things started happening. Accidents are a matter of bad timing. You know that. But what makes the timing? Just listen to the way these insignificant coincidences tricked me, pushed me into a corner!

Last night, you see, my wife stayed late after school. The president of the PTA met with a teachers' committee to talk about adding new playground equipment. Playground equipment! Such a trifling thing. They change it maybe once every ten *years*, but yesterday they had to talk about jungle gyms and teeter-totters, and my wife was late. Dinner wasn't ready at 6:30. Dinner is *always* ready at 6:30. (We watch the news — Walter Cronkite.) But last night dinner wasn't ready at 6:30.

It wasn't, in fact, ready at 7:00 when Rip Sanders dropped by to bring back a lawn seeder he'd borrowed. Once in 28 years Rip Sanders, or anybody else for that matter, has borrowed a lawn seeder from me, and *that* night at 7:00 had to be the exact time he brought it back. You see how strangely events conspire?

Now, Rip likes his shot or two. Everybody knows that. But if we'd been sitting down to dinner, or even cleaning up, he wouldn't have lingered those few seconds in the doorway, and I wouldn't have said, "Say, Rip, don't run right off. Grab a quick one before you start home. That's a long block!" It was almost automatic. Really. I mean, it's just the kind of thing you *say*. Now, I'm a helicopter pilot, and I just happened — just *happened* — to have alert last night (med evacs and such). I have it one night in seven, sometimes even less. And I started to pour myself a Coke after I'd mixed Rip's martini. I did! I had part of it poured. It was right there in the glass! But it just happens that Rip's the kind of guy who'll pressure you a little. Another guy, no, but Rip "Hey," he said, "you're not gonna waste good gin on me and then drink *Coke* f'r cryin' out loud!"

"Well," I drawled, "I'm on the schedule tonight. I really shouldn't." I resisted. It was in my tone and everything, and I stepped over to the door and took a real worried squint at the weather, which was scuddy; first bad day in a week. I admitted to myself that it didn't look like a night for flying. On a nice day I'd have been more cautious. I know it! I *think* flying on those good, sunny days and clear nights.

But I was still resisting when Rip said, "Naw, you're not gonna fly in that greasy stuff. C'mon, save that Coke for the kids." Then he stepped over and mixed me up a drink himself. Rip's aggressive that way. I mean, a lot of guys would have hung back, but he stepped right in. If I'd have lent my lawn seeder to anybody else, I could have squashed the problem right off. Or at least I could have made the drink a weak one.

But it wasn't anybody else; it was Rip, and he just really likes to handle the utensils. He's a natural with a swizzle stick. And he's not a one-drink man. He tipped off his martini and sighed like a connoisseur. "A-a-a-h, that was *fine!*" He didn't say it in the way of leave-taking; he said it in the way of settling in. Now I admit that I didn't mind. I'm not one to rush a guy off when he wants to stay. A little shop talk before dinner is good, settles the nerves.

"Here," I said, "let me fill that. You've got a minute to sit down." Some days, you know, he wouldn't have stayed. He'd have had to hurry off for *his* dinner, or for some crummy meeting or bowling match. But not last night. He took that drink and sat right down in my favorite chair. If he'd have sat on the sofa or on the stool, then I'd have sat in the chair and wouldn't have been left standing there by the bar where

it was so handy to mix a second martini. I never sit on the sofa. It's wrong for my legs or something. You see how very quietly these things work, how quickly they add up.

All this time my wife Janie was out in the kitchen getting dinner ready. Just as Rip had finished his second drink and was getting that vacant, just-about-ready-to-go look, in she came. "Hi!" she said. "How are you, Rip? Care if I join the party?" Now, nights before she teaches my wife doesn't drink, not even a cocktail, but the next day was a school holiday for teachers' convention. That's just how it was running against me. Two teachers' conventions a year, and tomorrow was one of them.

Anyway, I said, "Sure, honey, c'mon in and say something sweet."

"Let me mix this round," Rip said. "You two relax." I hadn't really thought at all about having *another* drink. It was all so natural. I guess I just assumed he'd mix only the two, one for Janie and one for himself. But there he came with another when I hadn't said a thing about it.

But it really didn't matter, because the phone rang *before* I'd finished the third one. I know that I hadn't finished it because the olive was still completely submerged. I remember looking at it very carefully. I remember that distinctly.

The phone call was, of course, a mission — a med evac to Walter Reed. Some little girl on a bicycle got hit by a moving van. The little girl was late for dinner. The van was late getting away from his pick-up and was in a hurry backing out of the drive. You might know. Timing. I get an alert like that maybe once every *three months*, and it had to be tonight. I wasn't worried about the flying, though, not a bit, because I felt fine. I waved good-bye to Rip and Janie, grabbed a handful of chlorophyll tablets to chew as I ran through the kitchen, and I was on my way.

I knew that the drinks hadn't bothered me because I was in such good control of the car. I kept noticing, in fact, what good control I had. Even putting in the key. I put the key in — Zip — first shot. I was ahead of every move. I touched the wheel just *so* lightly and held the speedometer *exactly* on the speed limit. It was the same in the chopper. Good positive control in the hover. I felt fine.

Now there's a fence just off to the north of our main pad. It's a worthless kind of fence, the kind that doesn't keep anything in or anything out, but just makes everything go around. *Last summer* they were going to tear it down, but they never quite got to it. We can save maybe twenty seconds by lifting straight over that fence instead of routing around it to the east and then doubling back, which is our normal pattern. It's no problem. I've done it maybe a dozen or twenty times before. But on this *one* night, the lighting — it was just after dusk and messy weather and everything — must have distorted my perspective the slightest bit.

Because I hit it. I hit that fence. *Just barely* hit it with my right main gear, but at fifteen knots or so that was enough to tip me over and bring a blade down into the fence, too. We dinged in pretty hard. I admit that. But considering everything, I did a good job. I mean I got it down right side up, and we didn't get hurt. I was worried sick about the girl, but she came out okay. They drove her to Washington in an ambulance because she was too scared to get back into another helicopter. That was embarrassing somehow. It bothered me as much as the accident. It bothered the commander, too.

Now listen, there were a lot of circumstances in that accident, a lot of peculiar little things that nudged me into a bad situation. I'm a normal guy, a real good pilot. Surely the board will consider my record and see all those circumstances, those curious bits of bad timing that worked against me. But today's only the *second* day after I heard that cat.

I'll be honest with you. I'm scared! I'm really scared.

## A fascinating new system from the end of the Greek alphabet

by Maj John Livingstone
MAC/DOVN

I RECENTLY ATTENDED the Institute of Navigation's Omega Symposium in Washington, D.C., and was both astonished and encouraged by the international interest in this new, unique navigational system. The potential for a world-wide, radio navigation system, with demonstrated accuracies of one-to-two nautical miles at positions as far as 3,000 to 4,000 miles from a transmitter, brings joy to the heart of this old navigator. I have become a convert.

Named after the last letter in the Greek alphabet, Omega, in the navigational sense, is neither the first radio system for position fixing nor the "living end." It will not solve all our navigational problems. It does, however, present us with the first truly world-wide radio navigation system and promises to keep pace with the more stringent navigational requirements of the future.

As international air traffic increases in the years ahead, track systems, such as the North Atlantic Tracks in use today, will become more common and more complex, making precision long range navigation imperative. For example, the FAA envisions a requirement for as little as 30 nautical mile lateral separation on the North Atlantic Tracks, possibly as soon as 1980. In addition to needing the ability to operate in the air traffic control environment of the future, MAC's global mission

# Omega Navigation

requires pin-point positioning of aircraft, anytime, in any weather, any place on earth. Omega, in conjunction with other systems, will go a long way toward satisfying these needs.

Omega will be a network of very low frequency (VLF), long range, radio stations, operating at 10.2, 11.33, and 13.6 KHz. When broadcasting at the full power of 10 KW. the range of each station will be in the vicinity of 6,000 nautical miles. With this great range, only eight stations, located around the world, will provide full global coverage.

Presently, there are four Omega stations operating with limited power, on a test basis. They are located in Forestport, NY; Hawaii; Trinidad; and Norway. The station at Forestport will soon be moved to North Dakota and should be fully operational early in 1972. The other test stations will be upgraded to fully operational status by the end of 1973, and with the addition of stations in Japan, Reunion Island, Australia, and Argentina, the entire network is scheduled to be in full operation by the end of 1974.

## How it Works

Omega stations establish hyperbolic lanes quite similar to the ones we've used with loran, except a single station covers much more area. The receiver in the aircraft, by measuring the relative phase relationship between any two stations, establishes a line of position (LOP). Using pairs of stations, the system can provide a fix based on two intersecting LOPs. The Omega receiver and its computer can convert the fix directly into latitude and longitude and display this information for the navigator. The computer can also provide and display cross track, along track, wind, and estimated time en route information.

## Questions?

I know some of you "old timey" navigators are going to throw up your hands in horror and I can already hear your questions . . .

*"You mean I don't get to read out the lane numbers and plot them anymore?"*

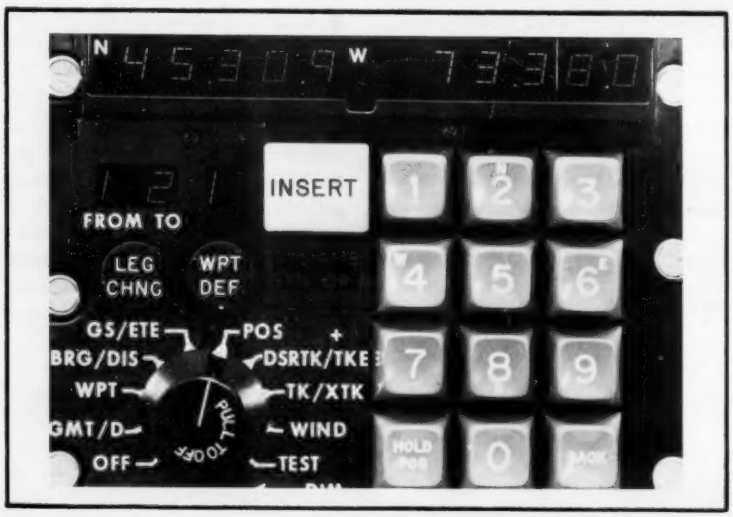
Nope. There's no need to. Actually, you don't even need an Omega chart to use the system. To be able to read out latitude and longitude coordinates is a real advantage. They tell you where you *are*. If you have to plot, you only know where you were. In high speed aircraft, "real time" fixing like this makes your job much easier.

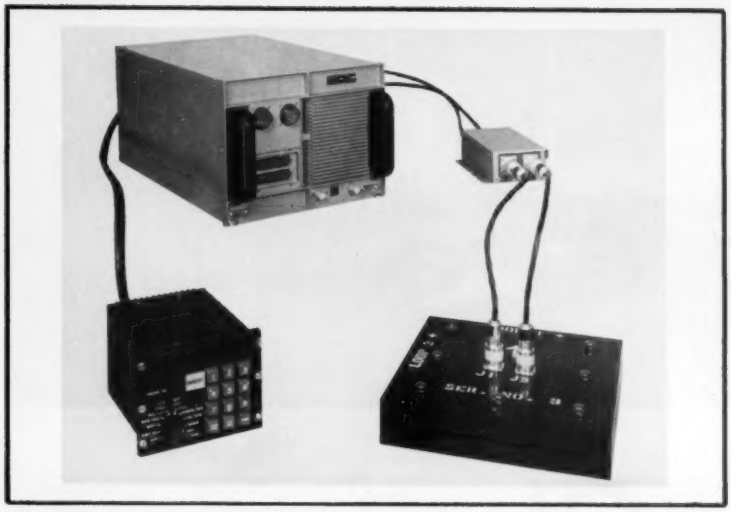
*"How do I know the information is good?"*

First, remember that Omega is only a fixing aid to your dead reckoning. The idea is to use it to cross check other systems — inertial, doppler, celestial, or whatever. Second, the receiver/computer is designed to alert you when the system is receiving bad information.

*"Harrumph! What about skywaves?"*

Good point; skywaves and diurnal





shifts do affect Omega. However, since they are predictable, the engineers have programmed corrections in the computer. All you must do is add your position (within 30 NM), the julian date and time. From there on the box does the rest.

*"Does precipitation static affect Omega?"*

Yes, it is a factor. With wire antennas, precipitation static can be a real headache but, once again, the engineers have provided a solution. By using an orthogonal loop antenna, precipitation static has become a minor issue. Aircraft equipped with Omega have penetrated thunderstorms and the wall clouds of hurricanes without losing usable signals. Our Navy counterparts have even been able to receive Omega signals which were adequate for navigation while submerged. (In submarines, not airplanes, of course!)

*"What about size, cost and reliability?"*

The airborne system consists of four elements: an antenna, coupler, receiver-transmitter, and control panel. Together they weigh between 52 and 60 pounds, depending on the degree of sophistication. The "today" cost figures are between $38 - 50 thousand per airplane, but this should decrease as production increases. Reliability is one of Omega's strong points. Already, one manufacturer will guarantee a mean time between failure (MTBF) of 1,000 hours. The systems actually do better than this. The people I talked to, who have been using Omega, indicated that the average MTBF is closer to 2,000 hours.

Omega is also easy to maintain. In the field, repairs are just a matter of replacing black boxes, after using a simple test panel to determine which box is bad.

## Conclusions

Omega is a reliable, relatively low-cost, long-range navigation system. Some proponents of Omega see it as an eventual replacement for VOR, but I think its greatest potential lies in using it as a hybrid system, such as Omega/inertial. Like any new system, it will have growing pains, but I'm confident they can be solved.

I am convinced that Omega offers more than just a fancy substitute for loran. Loran-C, for example, affords coverage over only 25 per cent of the Northern Hemisphere. Omega will cover the world. I believe Omega offers us a navigational aid uniquely responsive to our world-wide mission.

If you see Omega as another step leading toward the demise of the navigation profession, I offer this quote from Arthur J. Hughes, author of *History of Air Navigation*, "I do not fear that ground control or radar, or any other device, will mechanize navigation; always the machine will house the quiet, steady man of method and skilled observation that brings the ship to rest."

Omega — it's a beginning, not an end.

When air traffic control tells you to "cruise," what does it mean?

# Cruise Clearance

THE SLEEK STARLIFTER was inbound to McChord for a quick stop and then on to Travis. A long trip would soon be over. With the descent briefings completed, Seattle Center turned them over to McChord approach.

"Roger, Seattle, McChord on 391.9, good day," the copilot called. "McChord Approach, MAC 60654 level 6,000."

"Roger, Mac 654, level 6,000, squawk ident. Radar contact. You're cleared to hold west on the 250 degree radial 13 to 15 DME of the McChord Tacan, maintain 6,000 feet. You're cleared present position direct. Report established in holding. McChord weather is presently measured 300 feet, 3/4 miles in light rain. You can expect a Tacan ILS 1 to runway 34. Expect approach clearance at 45, time now 33. We're presently recovering four F-106s coming off target."

"McChord Approach, MAC 654 established in holding."

The fighters touched down and soon . . .

"MAC 60654, you're cleared to McChord via the 15 mile arc, cruise six thousand." Now let's pull that imaginary crew out of the cockpit and put *you* in it. What does the clearance, *"cruise 6,000,"* mean to you and what will you do?

Recently FAA published an advisory amending and clarifying just what a cruise clearance is. This is their definition:

"Cruise — a word used in an ATC clearance to indicate to a pilot that climb to and descent from the assigned altitude may be made at his discretion. It is also approval for the pilot to proceed to and make an approach at destination airport and can be used in conjunction with (1) an airport clearance limit at locations with an approved/prescribed instrument approach procedure. The FAR's

require that if an instrument letdown to an airport is necessary the pilot shall make the letdown in accordance with an approved/prescribed instrument approach procedure for that airport, or (2) an airport clearance limit at locations that are within/below/outside controlled airspace and without an approved/prescribed instrument approach procedure. Such a clearance is NOT AUTHORIZATION for the pilot to descend under IFR conditions below applicable MEA/MOCA nor does it imply that ATC is exercising control over aircraft in uncontrolled airspace; however, it provides a means for the aircraft to proceed to destination airport, descend and land in accordance with the applicable FAR's governing VFR flight operations. Also, it provides search and rescue protection until such time as the IFR flight plan is closed."

In the clearance you received from McChord Approach they advised you that you could descend from 6,000 feet at your own discretion and that there was *no known IFR traffic* between 6,000 feet and the applicable minimum obstruction clearance altitude. In other words, it's up to you to provide your own terrain clearance and to keep your eyeballs open for the little bug smashers churning about where they shouldn't be.

If you will check the diagram you will readily see that you had better not descend below 5,400 feet until you are established on the inbound course. This is a good example of a clearance to descend, but you better watch out below.

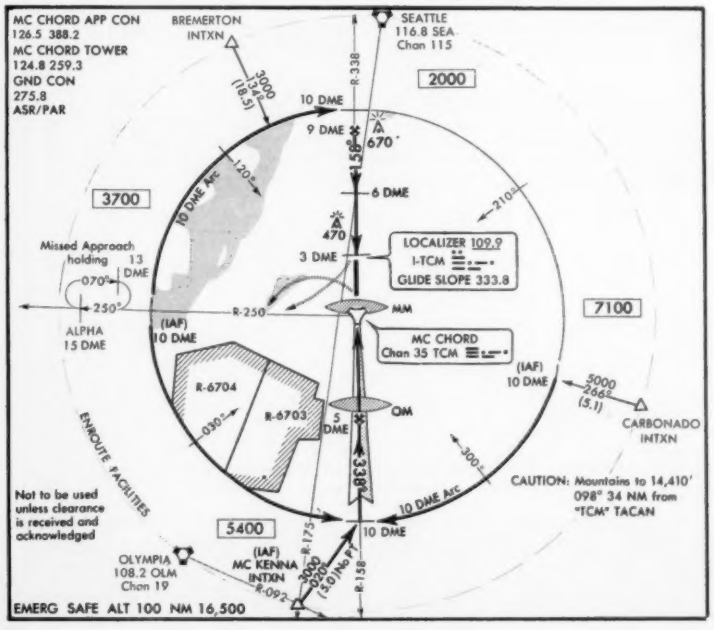
The clearance also authorizes you to execute any approved instrument approach procedure serving McChord and it assures you that the airspace for the approach to any runway (including the missed approach procedure) is free of any known IFR traffic.

Our example has been a flight in controlled airspace, but what about an operation outside controlled airspace or without a published approach? We'll seldom face this problem flying line missions, but stateside air evac or trips into some small island airfields could confront you with this situation. This is FAA's explanation:

"A flight will be conducted into an airport that could be within/below/outside controlled airspace but without a prescribed/approved instrument approach procedure. The clearance would read the same as above. The difference here is the fact that the airport does not have a prescribed/approved instrument approach procedure and that a portion of the flight may be conducted in uncontrolled airspace. Upon arrival at destination airport, the pilot would be expected to make a descent below applicable minimum enroute IFR altitude/minimum obstruction clearance altitude and land in accordance with applicable Federal Aviation Regulations governing VFR operations; however, if IFR conditions existed upon arrival the pilot would be expected to advise air traffic control and request further clearance."

In either case, it's the pilot's responsibility to adhere to the applicable Federal Aviation Regulations. If you still have any doubts about what you're expected to do, and what a cruise clearance means, contact your friendly flight facilities officer for more information.

Basically, a cruise clearance is an air traffic control service normally used in uncongested areas for short duration flights. For example, one might be given for lost communications procedures on a radar approach. A word of caution, though: like any clearance, if you can't adhere to it or you haven't done your homework and aren't sure what it means, ask ATC for a clearance you can execute and save your cruise for a later date.



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# ROLL OF

AS OF 1 JANUA

## CONSECUTIVE ACCIDENT-FREE FLYING HOURS

### WINGS

**750,000**
436 MAWg

**500,000**
437 MAWg

**250,000**
89 MAWg

### SQUADRONS

**500,000**
76 MASq

**300,000**
3 MASq 14 MASq 75 MASq

**200,000**
20 MASq
41 MASq
99 MASq

**100,000**
1 ACGSq
4 MASq
15 MASq
44 MASq
57 MASq
86 MASq
98 MASq
939 MAGp (Assoc)

1605 ABW
436 ABG
438 ABG
1 ACG
3 MAS
7 MAS
14 MAS
57 MAS
76 MAS
54 ARR
67 ARR
76 ARR
79 ARR

# OF HONOR

JANUARY 1972

## CONSECUTIVE ACCIDENT-FREE FLYING YEARS

### 20 YEARS OR MORE

89 MAWg  98 MASq  99 MASq

### 10 THROUGH 19 YEARS

1605 ABWg
436 ABGp
438 ABGp
1 ACGSq
3 MASq
7 MASq
14 MASq
57 MASq
76 MASq
54 ARRSq
67 ARRSq
76 ARRSq
79 ARRSq

137 MAGp (ANG)
138 MAGp (ANG)
151 MAGp (ANG)
153 AAGp (ANG)
164 MAGp (ANG)
167 AAGp (ANG)
170 AAGp (ANG)
171 AAGp (ANG)
172 MAGp (ANG)
301 ARRSq (AFRES)
303 ARRSq (AFRES)
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917 MAGp (AFRES)
937 MAGp (AFRES)

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Det 2, 40 ARRWg
Det 3, 40 ARRWg
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TUSLOG Det 84
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Det 10, 43 ARRSq
Det 14, 43 ARRSq
Det 1, 44 ARRSq
Det 4, 44 ARRSq

# Mishap with a Moral:

IT WAS EARLY AFTERNOON as a large four-engine jet transport was prepared for departure from an international airport on the east coast of the United States. The aircraft was scheduled for a positioning flight to another airport where passengers would be loaded for an overseas trip. With a full crew aboard, the aircraft's engines were started and it was taxied from the ramp.

The highly experienced cockpit crew (the captain had over 22,000 total flying hours and the first officer had over 15,000) completed all the checklists as the big bird lumbered out. Inbound afternoon traffic was heavy, and the crew was instructed to hold short of the runway for several minutes. Finally, they were cleared onto the runway and, at approximately 1605 local time, they were cleared for takeoff.

The copilot, making the takeoff from the right seat, smoothly eased the throttles forward. As the engines spooled-up, he called for the captain to "set the power." The aircraft accelerated normally toward the planned rotation speed of 124 knots.

As the airspeed passed 80 knots, the aircraft rotated and its nose wheels left the runway. The nose continued to rise and, as the airspeed reached 91 knots, the tail skid began dragging on the runway.

When the aircraft was nearly 2,800 feet down the runway with the tail skid still dragging, the captain said, "Let's take it off." The aircraft became airborne at a speed of 117 knots, and slowly rotated to an unusually nose high attitude. Immediately after lift-off, the stick shaker activated and the first officer said, "Can't control this thing . . ." The aircraft continued to pitch up and reached an estimated 60 to 90 degree nose-up attitude at an altitude of 300 to 500 feet above the ground. It rolled about 20 degrees to the right, then rolled back into a left bank of approximately 90 degrees. The nose fell through the horizon and the aircraft descended in a left-wing-down, nose-down attitude. Forty-five seconds after beginning the takeoff roll, the aircraft impacted on its left wing and nose, and immediately burst into flames. Rescue crews arrived at the wreckage about 30 seconds after the accident and brought the fire under control in approximately 5 minutes. All 11 crewmembers, the only occupants of the aircraft, were killed.

## Investigation

The aircraft wreckage was confined to an area approximately 250 feet long and 375 feet wide. After the wreckage had been examined in place, unburned portions were moved into a hangar for detailed analysis, with particular attention to things that could affect the pitch control of the aircraft.

The horizontal stabilizer trim setting was 2 degrees nose up, which was the correct takeoff setting for the existing gross weight and center of gravity. The wing flaps were extended to 23 degrees, the normal takeoff position. The leading edge slots were opened properly on the right wing, but because of extensive damage, the position of the slots on the left wing could not be determined. The pitch trim compensator actuator was fully retracted; properly positioned for takeoff. The flight control gust locks were not engaged, and both the flight and ground spoilers were fully retracted. The landing gear was down and locked, and the elevator autopilot servo was disengaged. There was no evidence of malfunction in any control cables or linkages for the elevator control.

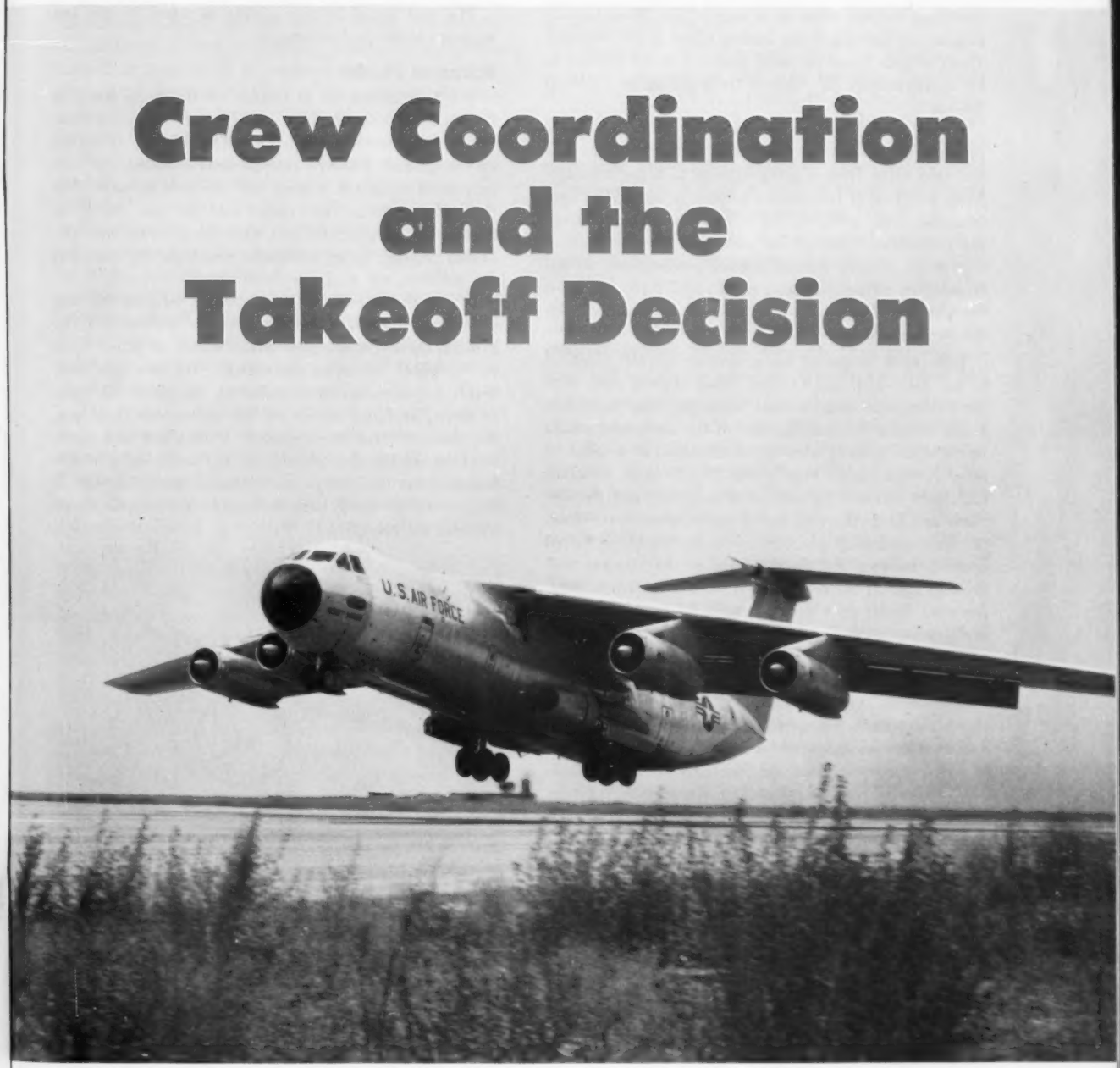
While the wreckage was being analyzed, other aspects of the flight including weather, crew qualifications, navigational aids, communications, and airport facilities were studied.

Investigators discovered the airport was in the midst of an expansion and modernization program which included relocating taxiways and increasing the size of the parking ramp. Old paved surfaces were being removed and — although the airport was swept continuously — pieces of pavement, small rocks and other debris were found on several areas of the airport. These areas were normally used for aircraft ground operation and had been used by the accident aircraft.

The aircraft wreckage provided some valuable clues. Investigators found a suspicious hole in an access door on the rear spar of the right horizontal stabilizer. The leading edge of the right elevator, located just aft of this spar, was gouged and scratched. Additionally, material found around the edges of the hole was analyzed and found to be asphaltic — a substance normally used in pavement!

The elevators, on the aircraft type involved in the accident, are controlled aerodynamically, by flight tabs which are mechanically linked to the control columns. The elevators are hinged to brackets which are mounted on the aft spar of the horizontal stabilizer and they are

# Crew Coordination and the Takeoff Decision



# Mishap with a Moral:

connected to each other by a torque tube. Mass balance weights are installed in the leading edges of the elevators. These weights cause the static position of the elevator to be approximately 27 degrees trailing-edge-up (aircraft nose-up).

If the control column is moved aft from this static position, the elevators do not move; only the flight control tabs move from trailing-edge-up to a trailing-edge-down position. If the control column is moved forward from the static position, the control tab remains fixed and the elevators move from trailing-edge-up to trailing-edge-down. During normal takeoff acceleration, the increasing aerodynamic loads, as airspeed increases, blow the elevator down, toward a position streamlined with the horizontal stabilizer.

Tests were conducted using another aircraft identical to the one which had crashed. They showed that, with the elevators in their normal static position, there was a gap between the trailing edge of the horizontal stabilizer and the leading edge of the elevators. If a stone or other foreign object were placed in this area, it would fall down between the horizontal stabilizer and the elevator and lodge there. If the elevators were moved from the trailing-edge-up position, the stone would be forced upward, between the leading edge of the elevator and the rear spar of the horizontal stabilizer, until it became jammed. With an object jammed between these two surfaces, elevator movement toward the trailing-edge-down position would be virtually impossible. (See diagram.)

No foreign object was found in the tail section of the aircraft wreckage, but many asphalt covered stones were found on the ground near the accident scene.

## Probable Cause

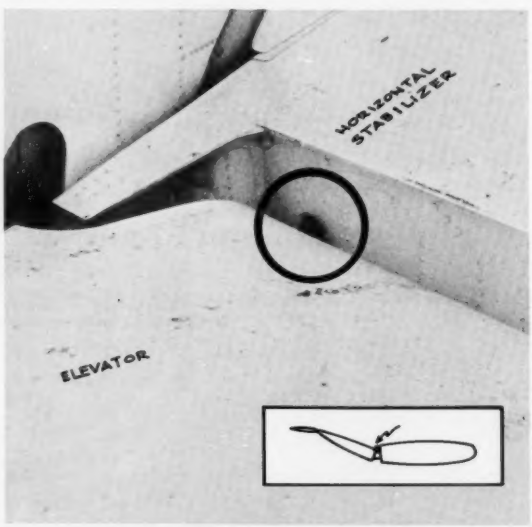
"The Board determined that the probable cause of this accident was a loss of pitch control caused by the entrapment of a pointed, asphalt-covered object between the leading edge of the right elevator and the right horizontal spar web access door in the aft part of the stabilizer. The restriction to elevator movement, caused by a highly unusual and unknown condition, was not detected by the crew in time to reject the takeoff successfully. However, an apparent lack of crew responsiveness to a highly unusual emergency situation, coupled with the captain's failure to monitor adequately the takeoff, contributed to the failure to reject the takeoff."

The real moral in this mishap is stated in the last sentence of the probable cause.

## Points to Ponder

The first indication of trouble on the flight came at 80 knots on takeoff, when the aircraft rotated prematurely. Four seconds later, the tail skid began dragging on the ground. *Thirteen* seconds after rotation, the captain ordered takeoff. Fifteen and one-half seconds after the early rotation, the copilot said he was unable to control the aircraft. By this time the aircraft was airborne, rotating to an extremely nose-high attitude, and the accident was probably inevitable.

During the thirteen or more seconds between the first indication of trouble and the time the aircraft left the ground, there was one appropriate course of action open to the pilots — reject the takeoff. Yet two qualified, highly experienced pilots failed to recognize the need to abort, or failed to act on the indications they had. No one will ever know exactly what these men were thinking during the takeoff or the short flight which followed, but the board's investigation uncovered several factors which could have influenced their decision to continue the takeoff.




**The fatal foreign object probably lodged here, as reconstructed on another aircraft of the type involved in the accident.**

The majority of the published procedures for aborted takeoffs in various aircraft types indicate — directly or indirectly — that the primary reason for a rejected takeoff at high speed is engine failure or power loss. Experience has shown this to be incorrect. Between January 1964 and January 1970, 21 accidents and incidents resulting from high speed aborts were reported to the National Transportation Safety Board. Of the 21 takeoffs *only 2* were refused because of power loss. The published procedures tend to condition pilots to reject a takeoff in the event of engine failure, when in fact there are many other circumstances that could dictate an abort.

Additionally, many established procedures warn that a refused takeoff at high speed is a dangerous maneuver. Under some circumstances this warning is certainly valid, but emphasis on the danger involved further prejudices pilots against rejecting takeoffs.

The operating instructions of the air carrier involved were not clear regarding specific crew duties during an aborted takeoff when the copilot is flying the airplane. The instructions did state: ". . . the captain always retains the decision regarding the discontinuance of the takeoff . . ." and ". . . if he is not handling the controls himself, he (the captain) must take over."

To make a valid decision to continue or to abort a takeoff, the pilot in command must know what's going on in the airplane. If he is occupied with duties normally performed by the copilot, such as setting the power, monitoring engine instruments, checking the position of the trim and flaps, he may not be completely aware of what's happening. That appears to be what happened in this case. For example, the captain never questioned the copilot about the early rotation, and when he ordered the copilot to ". . . take it off," he was apparently unaware that a problem existed — even though there had been valid indications of a malfunction for the previous thirteen seconds.

It is well proven that human behavior is influenced by circumstances surrounding an event and the prior experience of the people involved. In this case, events immediately prior to the attempted takeoff tended to deemphasize the possibility of an abort. The airfield was extremely busy and the crew had been advised of a need to expedite their takeoff. The tower operator had said, ". . . be prepared for immediate . . ." and later, ". . . traffic turning base . . ." The crew's most pressing concern was getting their aircraft off the ground — not stopping on the runway.

Additionally, all the crewmembers had extensive experience in the aircraft they were operating. They knew the trim and flaps were set properly and that there were no passengers aboard. They also knew the engines were performing normally and, at their light weight, they had more than ample power available. These factors could predispose them toward a decision to fly the aircraft out of trouble rather than refusing the takeoff.

We must also consider that a jammed elevator is a highly unusual malfunction. So, although the indications they had were valid for the condition that existed, the aircraft's abnormal behavior would be confusing to the crew. Apparently, the true nature and severity of the difficulty did not become obvious to them until the aircraft had left the ground and recovery was impossible.

There are few emergencies in today's modern jet transports. As a result, crew performance tends to become a patterned response conducted with little, if any, conscious thought. If something unusual occurs to disrupt the normal sequence of events, the crewmembers must first recognize the problem and analyze its effect. If they decide it will prevent completion of their planned actions, they must recall an alternate procedure and execute it. There are ways to reduce the amount of time required to accomplish these steps.

First, good crew coordination must be established. Each crewmember must understand exactly what is expected of him — and of other crewmembers — during each phase of flight. They must work together, closely monitoring and cross-checking each other, and freely questioning any apparent deviations from normal. This spirit of mutual assistance can lead to early detection of mistakes or problems and is the basis of effective crewmember utilization.

A pretakeoff briefing, covering aborted takeoff procedures, is another important factor. This briefing — which needn't be lengthy — serves two purposes. First, it reviews the specific procedures to be used. But more important, by talking about an aborted takeoff — however briefly — all crewmembers are conditioned to consider it as a possible course of action during an emergency. Simply mentioning an abort can improve your chances of successfully completing one if it should be necessary.

Doctor Mason, a distinguished aviation psychologist, wrote this article almost ten years ago. Times and people have changed, but the problems he discusses are still with us. You owe it to yourself and your crew to look at your actions in a slightly different light and consider the question of . . .

# Manhood vs. Safety

ONE OF THE CURIOUS CURSES of our culture is the conclusion that anyone interested in his own safety is far too frightened to play the game well or give the job its fullest measure and therefore should be sacked on the spot.

This is a sad but realistic truth relating to Man's own appraisal of — Manhood.

When it comes to "being a man" the average proud male cannot satisfy himself with buckling his biceps, or even by looking at the handsome progeny his seed has begotten.

Some secret spark of pride also directs that, should the occasion demand, the Man will also be willing to conduct himself like an utter Boob, disregarding all precautions — expressed or implied — in the performance of almost anything that will prove he isn't a Sissy.

We have lost a lot of good men that way.

And some of the characters classed as Sissies, because they have at least a small regard for their own skins, manage handsomely to survive, live to see another day, and in the process contribute magnificently to the total goal.

This seems to be today's unsatisfactorily unsafe story of safety education — be it flight safety, highway safety, or even something as relatively minimal as household safety.

Let's flash back a few years. Baseball was born in Hoboken, New Jersey, in 1846. It was born a bare-handed game. The first teams played with the same rock-hard ball that is used today. But the baseball glove hadn't been invented. Caught with bare hands, the ball broke hands and split thumbs. Not every catch was a lucky one.

And so it went along its maiming way for years until, one sunny day, Charlie White, who played for Boston and was tired of sore hands, came onto the field wearing a thin, but nonetheless protective, glove. He never got a chance to use it. He was laughed off the field with a chorus of catcalls:

"If ya that scared of th' ball, don't play" — "Catch the ball; don't MUFF it."

Gloves were not worn on an American baseball diamond for another five years. And baseball went through the same time-trials in the evolution of a catcher's mask, a chest protector and even today's hard hat.

Football, you will remember, fared no better in the development of "safety appliances." You may also recall that it has only been a few years since one of these bits of evidence for superior manliness was the cool defiance of a quarterback heaving his heavy helmet heavenward. Now there was a MAN who would lead the team to victory, the fans said.

No matter the game, the story has been essentially the same. You saw it in baseball, football, hockey, boxing— or that grimmest game of all — war.

Even in war the development of life-protecting headgear, garments and even safety practices historically has been considered a vile form of cowardice—unmanly and even unpatriotic!

Let's look at the record for a moment:

In the American Revolution, the soldiers of his Britannic Majesty, George III, wore brilliant red coats and white pants and marched in bold, shoulder-to-shoulder formation against the sharp-shooting guerrillas of the day.

The redcoats never really got the idea.

And about 140 years later the French Poilus and British Tommy Atkins were again marching off to war wearing crimson hats of cloth. Without so much as a change of uniform, they moved from the sidewalk cafes in Paris to the front.

With little more ado, they faltered and fell before the machine guns of the Germans — who happened to have been wearing very hard hats at the time.

Resistance to hard hats and the protection they afforded was not necessarily a soldier-of-the-line idea. Despite directives from superiors, local commanders resisted trading off the bravado of the bright and soft hat for the dull steel helmet. One British commander went so far as to declare that anyone in his command who wore a hard hat would be court-martialed on the spot for "cowardice in the face of the enemy."

It was just another case of a man trying to prove that he — as well as those in his command — weren't Sissies and could firmly establish their manliness just by flaunting safety!

Come to think of it — have you ever seen a picture of World War One's Black Jack Pershing or World War Two's Douglas MacArthur wearing anything but a soft

by Dr. Chaytor D. Mason, Psychologist, USC

hat? What were they trying to prove?

And then there was that firebrand of the ETO — old Blood-and-Guts Patton. He wore his hard hat, or at least a helmet liner, all of the time. But he had to prove how tough he was by insisting that the vehicles in his command move with tops DOWN — and to hell with whatever Old Man Weather happened to be dropping off at the time.

There are other stories and other examples and you can supply your own variations to the theme. But the essence of it all is simply this:

We can talk about Safety as a hoped-for ideal. But we will not even go through the motions of doing things safely unless they do not disturb our own ideas of what is manly.

It also means that, unless we make some sweeping changes in our own thinking about safety and about its relationship — if any — to manliness and all the business of being a man, we will continue to have the same old disappointing safety statistics year after year — in the air, on the highway, even in the home.

In the field of aviation safety, we can expect that the accident rate for junior flying officers will continue high because they are "manly" young men who are trying to prove themselves. But the same rates may apply for those officers in their "dangerous forties" who are trying to re-prove their manhood all over again.

Probably we will arrive at no improvement at all in the matter of safety until we reevaluate "manhood." First of all, this must be a personal reevaluation.

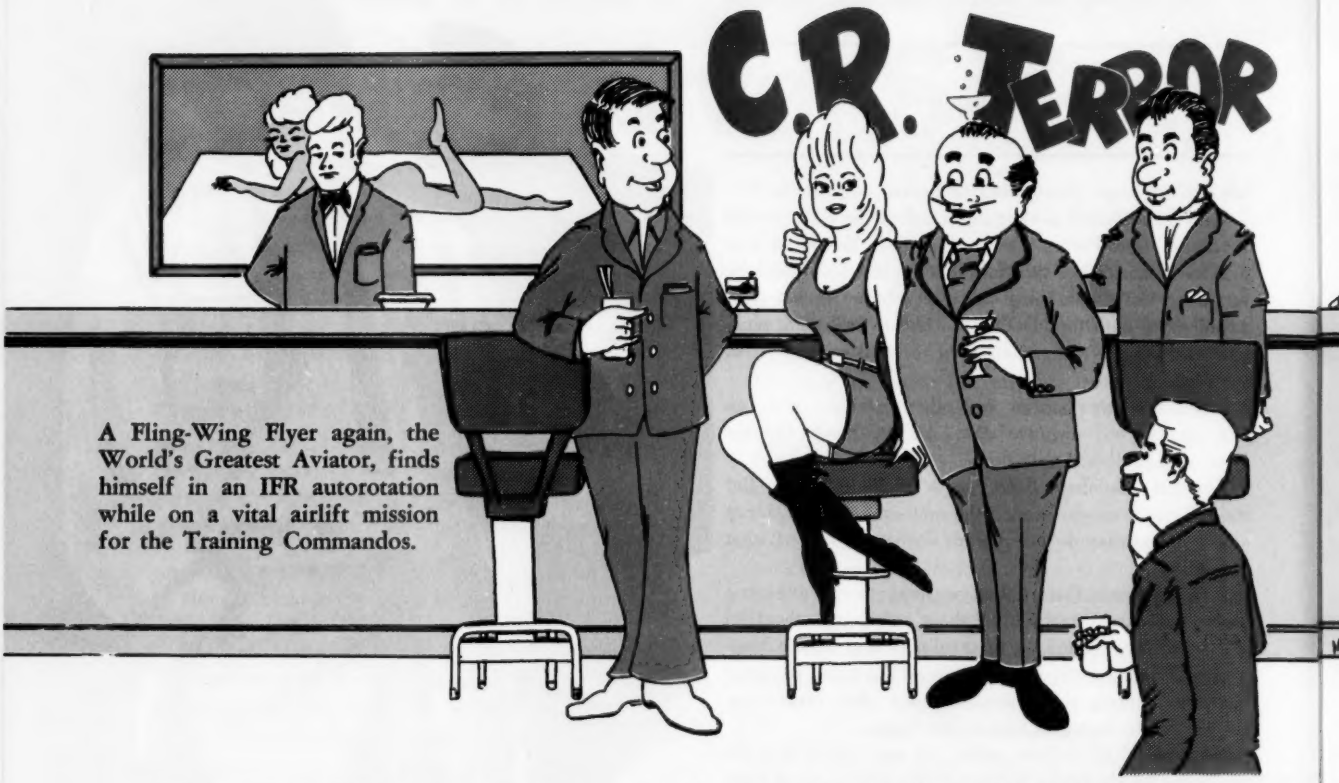
Is a MAN the one who runs headlong into a well-camouflaged machine gun nest knowing it means sudden death? Or is the real MAN the one who flanks the nest and throws in the destroying grenade?

Is a MAN the pilot who says "give me a plane and point me toward the target?" — or the one who says "a flak vest and a hard hat will help me on this mission?"

Is a MAN the one who scoffs, "I'll fly through this front or bust my butt?" — or the pilot who is willing to sit for a spell, wait for the ugly weather front to pass, and then gets up there to deliver the goods?

It's a strange heritage which decrees we are MEN only when we disregard caution.

It will take a lot of education.




A Fling-Wing Flyer again, the World's Greatest Aviator, finds himself in an IFR autorotation while on a vital airlift mission for the Training Commandos.

IT WAS FRIDAY NIGHT and, in the Officers' Club at a pilot training base in the southwest, happy hour was in full swing. The place was packed with young lieutenants, their dates, and a shaggy-looking rock group performing at a level of intensity just below the pain threshold.

In his favorite corner of the main bar, C. R. Terror, the World's Greatest Aviator, was holding court. He stood with his arm draped casually around the soft shoulders of the voluptuous lady seated to his right and faced the spellbound audience of young pilots before him. "Yes, gentlemen," the Old Master intoned pontifically, "there I was. Over the middle of the Pacific, with 87 helpless men, women, and children aboard, number four prop feathered, nothing but solid thunderstorms between me and the west coast, and then . . ."

The Rotund Raconteur paused dramatically and scanned the eager faces before him. "Then," he finally continued, raising the martini glass in his left hand for effect, "the engineer called me on the interphone and sez, 'Sir, we're losing oil pressure on number three!' "

While his appreciative audience expressed appropriate concern for the described dilemma, C. R. delicately sipped his martini and bestowed the erotic version of his famous Smile-Seen-Round-the-World on the lady by his side. But before he could continue his story, the Glib Guru was suddenly interrupted by a firm hand on his shoulder.

"C. R. old buddy," the owner of the hand interjected, "you're just the guy I'm looking for."

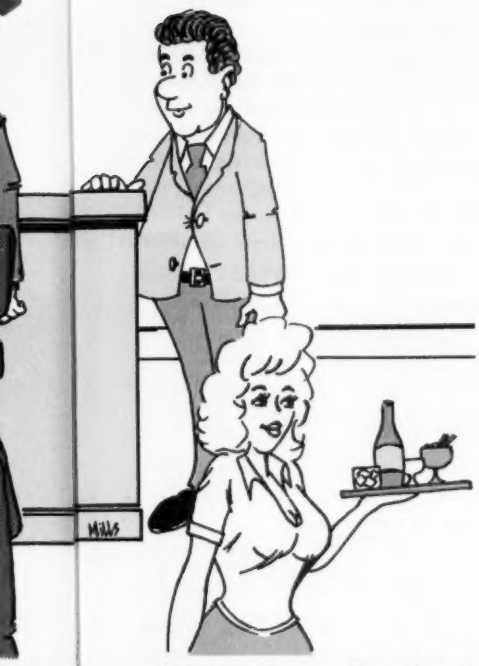
"Oh, er, hi," the Able Aeronaut blustered as he turned and recognized his LBR detachment commander. "What're you doing in the club on Friday night — luck out and get a kitchen pass?"

The graying lieutenant colonel merely shrugged and said, "No, Terror, I'm looking for you. On Friday night I figured this would be the best place to start and it looks like I was right."

"Well, you know me, colonel," C. R. replied cheerfully. "Always doing my part to support base facilities."

"Yeah, I know you all right," the colonel admitted. "But never mind that, I've got to talk to you about tomorrow."

"Oh, come on, boss," the Rotund One cried. "Tomorrow is Saturday



and Training Command doesn't work on weekends. There can't be anything for us to do."

"I'm afraid there is," the colonel corrected him. "It seems our operational control commander has laid another special mission on us."

"Don't tell me; let me guess," C. R. said drily. "He wants to go up in the hills to check fishing holes? He wants us to go over the border and smuggle back a couple cases of tequila? He wants us to fly over to the grammar school yard and put on a fire-fighting demonstration for his son's cub scout den? Am I getting close?"

"No, not really," the colonel chuckled. "It's a little more like official business this time. It seems some NORS parts for one of his T-38s are being delivered by civil air freight late tonight. He wants us to fly over tomorrow and pick them up at San Paso Municipal. It's only about an hour's ride each way so I told him we'd have his parts back here by 1100 tomorrow morning."

"I guess we can do that okay," the Rotund One admitted, "but it sure seems like we spend a lot of time running errands."

"Yeah, I know," the detachment commander agreed, "but this time we can do ourselves some good too. Remember Lieutenant Glitch, the new pilot just out of Hill that signed in yesterday?" C. R. nodded and the colonel continued. "Well, I've set it up so he'll go along with you. It'll give him a little flying time, and you can show him some of the local area."

"Fine," C. R. beamed. "I'll be more than happy to take the young man under my wing — or rotor — so to speak, and expose him to the joys of LBR helicopter flying, whilst I perform this vital airlift mission. Shall we say about eightish? In base ops?"

"I've already told Glitch to show at 0730, so he'll be there ahead of you." The colonel paused as if searching for the right words. "There's one other thing . . . ," he said.

"What's that?" the Aviator with Avoirdupois asked.

"While you're over there, the colonel wants you to pick up an imported bowling ball he's having shipped in from Scotland."

"I *knew* there had to be something like that!" C. R. cried. "Oh well, it's just part of the job I guess. Innkeeper!" he shouted over his shoulder to the man behind the bar. "Wine for my friends! The night is young, and there are hours to be filled with wondrous delights before I gird my loins to slip the surly bonds!"

* * *

At 0815 the next morning, C. R.'s powder-blue 427 Corvette slid to a stop in the base operations parking lot. The sun glistened on his chrome-plated command pilot wings as the Paunchy Pilot leaped out and bounced across the lot into the building. Once inside he quickly spotted a confused-looking lieutenant standing in the middle of the flight planning room with a bunch of papers in his hand.

"Ah, Lieutenant Glitch, I presume?" C. R. said as he approached the young man.

"Yes, sir," the lieutenant answered, offering his hand. "You must be Major Terror."

"Right on, m'boy," the Master Manipulator replied. "Are you about ready to get this show on the road?"

"I think so sir," the lieutenant said. "I've got us filed IFR via . . ."

"I. F. and R!" the Pudgy Pilot blurted. "Good grief! We're flying an HH-43, not a T-38! We don't need to go through all that IFR trash. We'll just fill out a little VFR local clearance and be on our way."

"But sir," the lieutenant insisted. "There's no reason we can't go IFR and . . ."

The Rotund One cut him off with a wave of his hand. "There's no reason we can't fly over there backwards either, Glitch. But that's no reason to do it. I can see you've got a lot to learn about the fling-wing business, but you just stick with me and I'll see what I can do to help ya. Okay?"

"Yessir," the young pilot conceded.

Moving at what seemed only slightly less than the speed of light, the Able Aeronaut snatched the papers from Lieutenant Glitch's hand, filled out a clearance, checked weather, glanced at the notams, paused to ogle a cute WAF dispatcher, filed, picked up his bag, and headed for

the door. Four minutes after he arrived, the Rotund One, with Lieutenant Glitch in close trail position, waddled out the door in search of crew transportation. A bus was waiting and moments later they arrived at the aircraft.

Through his wrap-around, emerald green Renauld sunglasses, C. R. squinted up at the rotor heads as they approached the Huskie. "Well, the top of the bird looks okay," he commented. "How's about you takin' a quick look around it while I get in, and we'll see if we can get off a little early?"

"Don't you want me to climb up on top to do the preflight?" Lieutenant Glitch asked.

"Are you outa your tree?" the Able Aeronaut challenged. "Didn't they teach you anything about safety at Hill? Why, you could fall off the top of one of these things and break your donkey! Besides, I flew this bird yesterday and it was fine. Just walk around it and see if anything is leaking out or if any big pieces are missing. And shake it up! I wanna get this thing off the ground sometime before noon!"

"Yessir," the lieutenant muttered, scurrying toward the helicopter.

"Glitch!" C. R.'s cry froze the young lieutenant in midstep. "What are these funny bundles and what are they doing in our helicopter?"

"Ah, they're parachutes sir," Lieutenant Glitch admitted. "I thought we'd be going IFR and we'd be above 1,500 feet, so I had them brought out."

"M'boy, you really do have a lot to learn," C. R. commented, shaking his head disgustedly. "In the Tweet and the White Rocket, I'm sure they taught you a lot about needle-ball-ripcord descents, but this Whirling-Winged-Wonder is a helicopter! Helicopters can autorotate out of trouble and return to old mother earth as gently as the hint of vermouth in a good dry martini. Now, get these bloody things out of here and hurry up with your walk-around. Time's a-wasting!"

"Yessir," the lieutenant cried as he sprang into action again.

Realizing that he wouldn't have time to perform a complete preflight, Lieutenant Glitch started with the right side of the aircraft. Before he got as far as the aft landing gear and tire, external power was connected, and as he neared the tail section he heard the starter winding up. He was reaching up to remove the tail pipe cover when — *Phmoom!* the engine started and blew the cover halfway across the ramp. Glitch abandoned the rest of the preflight and scrambled aboard as the rotors began turning. He was still struggling with his helmet, seat belt, and shoulder harness when C. R. snatched the collective up into his armpit, shoved the cyclic forward, and they lurched into the air.

"See," C. R. shouted over the noise in the cockpit. "Nothing to it when you're with an old pro. We're off the ground better'n 20 minutes early!"

Numbly, Lieutenant Glitch nodded his agreement.

Soon the trusty Huskie was level at 500 feet, on course. Lieutenant Glitch finished strapping in and then noticed that the Able Aeronaut in the other seat was wearing a headset instead of the required helmet.

"Gee, Major Terror," he said. "At Hill they told us to wear helmets all the time in the '43."

"Yeah, I know they're still teaching that junk," C. R. conceded. "When you're on alert, or out fighting fires, it's probably a good idea. But on a simple VFR cross-country like this it's not really necessary.

"Besides," he explained, "this big glass bubble acts like a green house and it really gets hot in here. If you're wearing a brain-bucket for any length of time your brain will get soft from the heat. If you suffer enough brain damage they'll make a safety officer or something out of you and then where'll you be?"

"Hummmm, I guess you're right," the young pilot admitted. "I never thought about it that way before."

C. R. grinned at him across the cockpit. "Well, now you have," he chuckled. "How about taking the bird for awhile? Just follow that big highway down there on the left and wake me up in about forty minutes."

"Yessir," the young pilot replied eagerly. "I've got the airplane."

The Paunchy Pilot arranged his bulk as comfortably as possible within the confines of the cramped cockpit, folded his hands across his ample belly, and within seconds was sound asleep. It seemed only moments later when Lieutenant Glitch shook him back to consciousness.

"Major Terror, Major Terror!" the young pilot cried. "Wake up, please!"

"Ah, er, yes, m'boy," the Rotund One grunted as his brain came up to speed. "What seems to be the trouble?"

"There's some clouds over those hills ahead, and I don't think we can stay VFR. Do you want me to get an IFR clearance?"

"Oh no, we needn't do anything that rash," the Able Aeronaut observed. "The tops aren't very high and we're light; we'll just climb up and go over 'em."

C. R. took the controls and soon they were over the broken cloud deck. "Ya see, m'boy," C. R. explained as he leveled the helicopter at 8,500 feet, "this bird has got the new Dash Eleven engine and we've got more power than we can use."

"As a matter of fact," he went on, "last winter when it was nice and cold, I took one of these little beauties up to 20,000 feet on a test hop

and did a jet penetration with it." He laughed, remembering the incident. "You should have heard approach control when I told them my type aircraft!"

"Yeah, I'll bet that was pretty funny," Lieutenant Glitch admitted, wondering how the Chubby Chopper Pilot had been able to breathe at 20,000 feet. The young pilot began looking around and noticed that the cloud layer below them was now solid and stretched as far ahead of them as he could see. "Gee," he commented, "I sure hope we start seeing the ground again pretty soon."

"Is not to worry, m'boy" the Pudgy Pilot assured him. "San Paso Municipal was reporting scattered clouds before we left, and I'm sure they'll stay good. A little band of clouds always forms over these hills. Soon's we get on the other side of them, it'll clear up."

Lieutenant Glitch nodded but continued to watch the clouds below them uneasily. He thought of how reassuring a parachute would be at their altitude and decided — if they had worn some — right along here he would have tightened the straps.

Suddenly the Huskie dumped its nose, the noise level fell drastically, and C. R. screamed, "Cripes — it's flamed out!" The Rotund One fumbled the aircraft into autorotation and mashed the starter button as they rapidly settled toward the menacing clouds below them.

"Have you got the starting fuel on?" Lieutenant Glitch cried, realizing C. R. had forgotten it.

"Ah, right, of course," C. R. blustered, turning the starting fuel switch on and pressing the starter again. But the engine still refused to respond. As they went into the clouds, C. R. gave up on the engine and concentrated on keeping the floundering helicopter right side up.

"Boy, I hope these clouds don't go all the way to the ground!" he wailed as they descended.

"Yeah!" Lieutenant Glitch agreed peering into the murk. "I'll let you know as soon as I can see anything."

The Master Manipulator of Wires and Tires stayed locked on the gages as the sturdy little Huskie dropped lower and lower. "See anything yet?" he implored as they passed the level of the highest hills — still in the soup.

"Negative, not a thing," was the discouraging reply.

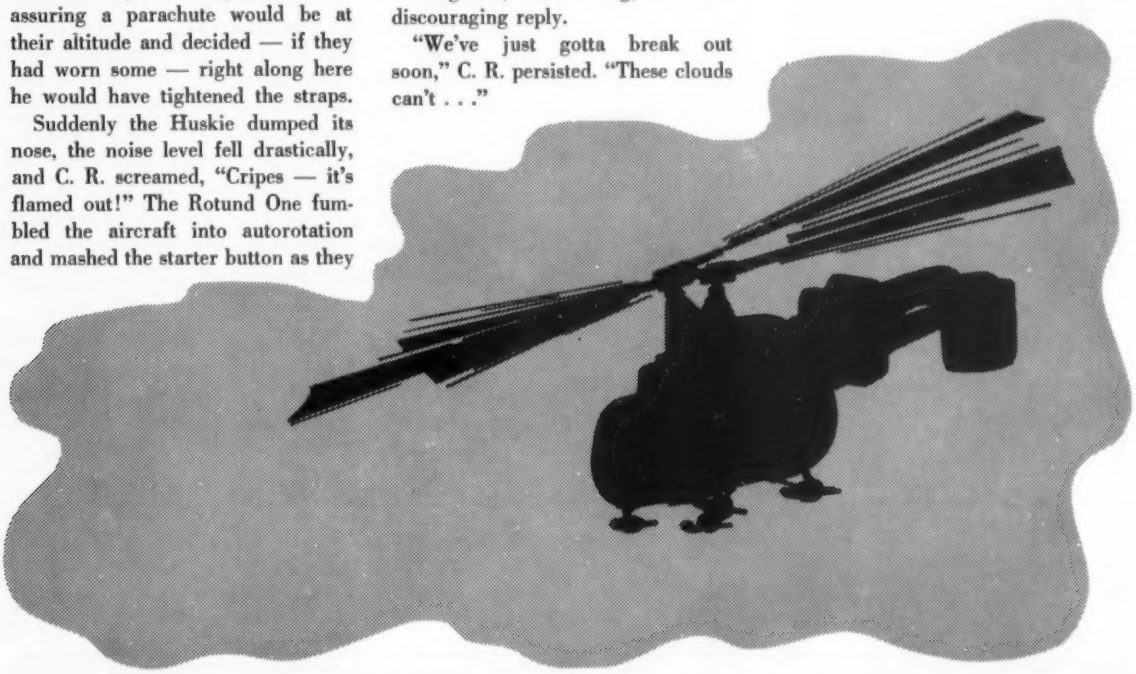
"We've just gotta break out soon," C. R. persisted. "These clouds can't . . ."

"TREES!! Look Out! Trees just below us!" the young pilot screamed, but before he finished speaking — and long before the Pudgy Pilot could do anything, the helicopter slammed into the side of a steep tree-covered slope. With a rending crash the rotors churned into the trees, smashing themselves to pieces. Free of its blades, the body of the Huskie plummeted down the side of the hill, shedding parts, and rolling over and over. In seconds the smashed helicopter lay still, at the bottom of a valley, in a growing puddle of oil and fuel. There was complete silence.

"Glitch?" C. R. finally moaned from beneath the wreckage, "are you all right?"

"Ah — I — I think so," the young pilot replied. "Are you?"

"Yeah," the Portly Prince of Pilotage responded. Then, as his confidence returned, he said, "See? We didn't need those parachutes after all!"



Don't be left out! Join the fun and . . .

# Get Cracking

OKAY, ISHMAEL, do it now! Don't be an outcast! Join the in crowd! Get involved! There's still time to submit your contest entry and maybe become famous. (We'd like to say rich and famous, but we can't, so we'll meet you half way.) Send us your entry postmarked before 31 March 1972 and we'll see if it can be printed here in these golden pages with your byline.

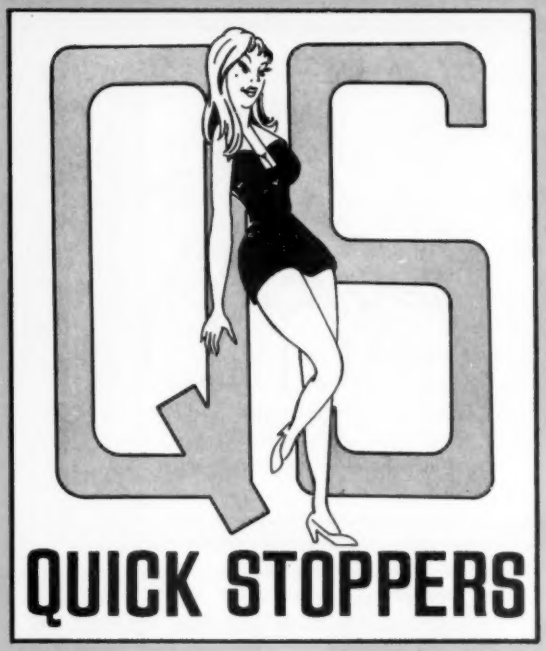
Time is short — but you work best under pressure anyway, right? So, tonight: unplug the boob tube — sit down with pencil, pen, typewriter, crayon, or whatever you write with — and create! Don't put it off any longer — do it now! Or Fanny will ....

The first three place winners will receive an engraved walnut desk set, presented by the Chief of Staff of the Military Airlift Command. Honorable Mention winners will receive a handsome pen and pencil set.

Who can enter? *You* can. All aircrew members, maintenance, and support people are vital to flying safety and are urged to enter. While only military personnel and DAF civilians assigned to MAC or MAC reserve forces are eligible for awards, anyone can submit an entry. All "non-award eligibles" will receive appropriate special recognition. No more than three entries per individual — please!

Your entry must be original, unpublished, and have a valid flying safety message for MAC. Other than that, your options are endless: fiction, non-fiction, technical articles, poetry, editorials — whatever turns you on. Please keep each entry between 1,000 and 3,000 words. That's about 6-14 pages, double spaced.

Your entry should be typed in two copies, double spaced, with no identification except the title. Then attach a cover sheet with the story title, your name, address (military address if you have one) and a brief biographical sketch. Mail your entry to: The MAC Flying Safety Writing Contest, MAC/IGYE, Scott AFB, Illinois, 62225. Entries must be postmarked no later than 31 March 1972, and must be received at MAC/IGYE on or before 7 April 1972.




## "Oh, Well, They're Only Passengers!"

Early passenger briefings aboard military aircraft allegedly went something like this: "Sit down, shut up, and keep yer feet off the seats." Pax airlift has changed greatly since then, but perhaps our passenger briefings still have a way to go.

According to a study of emergency escape and survival criteria for USAF transport aircraft: "The professionalism with which the passenger briefing is presented has a direct bearing on the passenger's confidence in the entire aircrew, the composure or panic level during emergencies, and the ability of many passengers to think and act rationally and survive."

## Collective Confusion?

A recent helicopter ding was caused by the pilot's apparent misunderstanding of a basic principle of fling-wing flying. An instructor pilot was demonstrating ground taxiing in an HH-43, with the beep in full decrease and almost minimum collective. Suddenly a gust of wind started to tip the bird over! The pilot tried to correct with cyclic — but he didn't increase collective, so his action had no effect. The Huskie fell on its side and tried to dig holes in the ramp with its rotors.

There's a simple rule of helicopter flying that the pilot should have applied, almost instinctively, in this case: *When in trouble on the ground, pick it up!* As soon as the bird started to tip, if the pilot had pulled in collective, he could have lifted to a hover and his troubles would have been over. Cyclic control — with no collective — isn't going to do much.

## Ops Normal

Mechanics were running all over the ship.
The DM was raging, his voice like a whip.
  The aircrew was cursing and hoping to learn
  How to taxi an airplane whose engines won't turn.
The block time was close; a delay drawing near;
The command post was bellowing—loud, long and clear.
  The picture looked hopeless, the mood very tense;
  Then a star-bearing limousine sped through the fence.
It screeched to a halt by the lifeless machine
And out leaped the boss to take charge of the scene.
  He raced from the car with a snarl and a curse,
  Threatening firings and mayhem — and worse!
The crew gave a shudder, the engine a roar;
The bird began rolling. They'd made it once more.
  The boss man departed, his eyes not so mean.
  An on-time departure; ops normal. Routine!

*(From an anonymous contributor)*

**"Did ya know Sam got a car for his wife?"**

**"Yeah? That's a pretty good swap!"**

## Hand-Held Hazard?

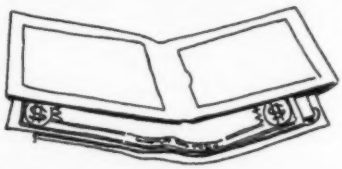
Hand-held fire extinguishers are important safety devices aboard our aircraft. They can also be very hazardous. Recently, one discharged accidentally in flight because it was not properly installed in the bracket. A ground check of several aircraft revealed that many of the hand-held fire extinguishers were improperly stowed. To install them properly, you must ensure that the carrying handle is placed under the handle guard. (See illustration.) This will prevent the handle from being inadvertently moved upward to the cocked position where a gentle bump could discharge the agent. The next time you do your walk-around, check the extinguishers for proper installation.

## Peephole Problem

Our C-141s are equipped with glass-covered landing gear inspection ports. There are good reasons for both the inspection ports and the glass covering. We need the ports to inspect the gear and we need the glass to protect the inspector.

Recently a crewmember learned this the hard way. While inspecting the landing gear, he removed the inspection port cover for a better look. As the gear was lowered, hot hydraulic fluid from a ruptured line sprayed his face, causing a painful injury. A word to the wise: Save your eyes — don't remove the inspection port cover.

## Thought for the Day



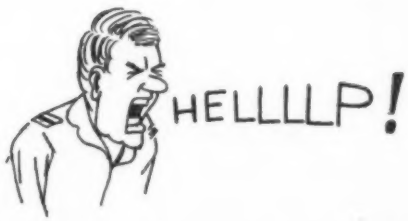
It's a good idea to save as much money as you can. Someday it may be worth something.

Which brings up the latest 747-funny. Know why they put the cupola cockpit "hump" on the Jumboeing?

So the captain can sit on his wallet.

*(Delta UP FRONT)*

## Squawk Up




When you're in flight and in a bind, you try to let everyone know about your problem. To ensure that everyone gets the message, let it all hang out: Squawk for help! A word of caution though: Some military radars cannot interrogate mode 3 code 7700; some FAA scopes don't respond to military emergency. To flag your dilemma to both kinds of controllers, you must squawk mode 3 code 7700 *and* select emergency on the wafer switch.

Another note: If *all* you have is radio failure, the procedure is a little different. Select mode 3 code 7600; FAA and military controllers will interrogate 7600 when they lose radio contact, see your squawk, and initiate radio failure procedures.

# the ANALYZER

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